

AMENDMENTS TO THE CLAIMS:

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1. (Currently amended) An optical functional device comprising: having a periodic structure with a first refractive index portion and a plurality of second refractive indices index portions,

wherein the second refractive index portions recur in a varying in recurring periodic patterns, pattern relative to the first refractive index portion, and
wherein each recurrence of the second refractive index portion has a variable refractive index. the periodic structure is variable.

2. (Currently amended) An optical functional device as claimed in claim 1, wherein the periodic structure includes second refractive index portions include a medium having an electro-optical effect, and by electrically controlling the medium from outside, it is possible to vary the periodic structure.

3. (Original) An optical functional device as claimed in claim 2,
wherein the medium is liquid crystal.

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4. (Currently amended) An optical functional device as claimed in claim 1,
wherein the refractive index of each recurrence of the second refractive index portion is varied periodic structure is formed by elastic waves propagating in one or more media, and the refractive index of each recurrence of the second refractive index portion is controlled periodic structure is varied by electrically controlling the frequency of the elastic waves from outside.

5. (Original) An optical functional device as claimed in claim 1,
wherein the periodical structure is two-dimensional.

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6. (Currently amended) An optical integrated device comprising:
a waveguide portion for guiding light; and
a periodic structure portion to which light is directed by the waveguide portion,
and which has a periodic structure with a first refractive index portion and a plurality of

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second refractive indices index portions,

wherein the second refractive index portions recur in a varying in recurring periodic patterns, pattern relative to the first refractive index portion, and

wherein each recurrence of the second refractive index portion has a variable refractive index. the periodic structure is variable.

7. (Original) An optical integrated device as claimed in claim 6, further comprising:

another waveguide portion for guiding light emitted from the periodic structure portion.

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8. (Currently amended) An optical integrated device as claimed in claim 6, further comprising:

a voltage applying portion for applying a voltage to the periodic structure portion for varying the variable refractive index. periodic structure.

9. (Currently amended) An optical integrated device comprising:
a periodic structure portion which has a periodic structure with a first refractive index portion and a plurality of second refractive indices index portions,

wherein the second refractive index portions recur in a varying in recurring periodic patterns, pattern relative to the first refractive index portion, and

wherein each recurrence of which the second refractive index portion has a variable refractive index periodic structure is variable; and

a waveguide portion for guiding light.

10. (Currently amended) An optical integrated device as claimed in claim 9, further comprising:

a voltage applying portion which applies a voltage to the periodic structure portion for varying the variable refractive index periodic structure.

11. (Currently amended) An optical integrated device comprising:
a light source portion that can vary wavelengths of emitted light; and

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a periodic structure portion which has a periodic structure with a first refractive index portion and a plurality of second refractive index portions,
wherein the second refractive index portions recur in a varying in recurring periodic patterns, pattern relative to the first refractive index portion, and
wherein each recurrence of the second refractive index portion has a variable refractive index. the periodic structure is variable.

12. (Original) An optical integrated device as claimed in claim 11, further comprising:

a waveguide portion for directing light to the periodic structure portion.

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13. (Currently amended) An optical integrated device as claimed in claim 12, further comprising:

another a second waveguide portion for guiding light exiting from the periodic structure portion.

14. (Currently amended) An optical integrated device as claimed in claim 13, 12, further comprising:

a third waveguide portion for guiding light exiting from the periodic structure portion.

15. (Currently amended) An optical integrated device as claimed in claim 12, further comprising:

a voltage applying portion that applies a voltage to the periodic structure portion for varying the variable refractive index. periodic structure.

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16. (New) An optical functional device comprising:

a periodic structure having a first refractive index portion and a plurality of second refractive index portions, the second refractive index portions recurring in a periodic pattern with respect to the first refractive index portion; and

a controller for varying the refractive index of the plurality of second refractive index portions.

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17. (New) An optical functional device as claimed in claim 16,
wherein the plurality of second refractive index portions include a medium having
an electro-optical effect, and wherein the controller electrically controls the medium to
vary the refractive index of the plurality of second refractive index portions.
18. (New) An optical functional device as claimed in claim 17,
wherein the medium is liquid crystal.
19. (New) An optical functional device as claimed in claim 16,
wherein the controller varies the refractive index of the plurality of second
refractive index portions by propagating waves in one or more media, and wherein the
controller controls a frequency of the waves.
20. (New) An optical functional device as claimed in claim 16,
wherein the periodic structure is two-dimensional.